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ABSTRACT

The literature on integration of academic and vocational education was reviewed to identify strategies for school districts planning to integrate their academic and vocational programs. Among the topics examined were the following: reasons for integrating academic and vocational education; meaning of curriculum integration; essential components of integrated programs; forms and examples of curriculum integration; effectiveness of various curriculum integration efforts; and policy questions entailed in integrating academic and vocational programs. After the literature review had been completed, an instructional guidance system was proposed as a starting point for school divisions planning to integrate academic and vocational education. The proposal called for the following: curriculum of integrated academic and vocational education that is organized around academic and technical skills and personal qualities and delivered through situated learning; interdisciplinary approach in both academic and vocational classrooms; collaboration between vocational and academic teachers to devise thematic units/projects/assessments; curriculum situated in both school- and work-based learning environments; and appropriate connecting activities, including career counseling and service learning, to link both environments. (Contains 20 references. Also included is a 59-item annotated bibliography.) (MN)

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ED 404 440

THE INTEGRATION OF ACADEMIC AND VOCATIONAL EDUCATION

SYSTEM DESIGN

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Virginia Commonwealth University and the school divisions of Chesterfield, Colonial Heights, Hanover, Henrico, Hopewell and Richmond established the **Metropolitan Educational Research Consortium** (MERC) on August 29, 1991. The founding members created **MERC** to provide timely information to help resolve educational problems identified by practicing professional educators. **MERC** membership is open to all metropolitan-type school divisions. It currently provides services to 7,000 teachers and 120,000 students. **MERC** has base funding from its membership. Its study teams are composed of University investigators and practitioners from the membership.

MERC is organized to serve the interests of its members by providing tangible material support to enhance the practice of educational leadership and the improvement of teaching and learning in metropolitan educational settings. **MERC's** research and development agenda is built around four goals:

- To improve educational decision-making through joint development of practice-driven research questions, design and dissemination,
- To anticipate important educational issues and provide leadership in school improvement,
- To identify proven strategies for resolving instruction, management, policy and planning issues facing public education, and
- To enhance the dissemination of effective school practices.

In addition to conducting research as described above, **MERC** will conduct technical and issue seminars and publish reports and briefs on a variety of educational issues.

The Integration of Academic and Vocational Education

System Design

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January 1997

*The views expressed in MERC publications are those of individual authors and not necessarily those of the Consortium or its members.

Executive Summary

In December 1996, the Metropolitan Educational Research Consortium (MERC) expressed an interest in the connection of vocational and academic education. This paper first reviews the literature on the integration of academic and vocational education, and then proposes a system design to improve educational services to all students.

The literature presents both problems and opportunities for professionals working in the area of vocational education. The problem it presents is a "fuzzy" literature with few certainties. The opportunity it presents is a "fuzzy" literature with few certainties. Within this ambiguity, we found the components of an integrated academic and vocational education program.

Building on the literature, an outline of an instructional guidance system is offered as a beginning point for school divisions embarking on this promising path. The study begins with (1) a clear definition of what is expected of students, (2) curricular frameworks which organize this expectation into sequential curricula and instructional materials, methodologies, and assessments, and (3) an individual and program monitoring system which accounts for the delivery of the system. The following definition guides the development of an integrated system of academic and vocational education.

> An integrated system of academic and vocational education is one which provides students the opportunity to learn the appropriate academic and technical skills required in the workplace. It also encourages growth in a system of personal values which are conducive to developing a work ethic. These curricular concepts gain coherence when they are organized into career majors and occupational clusters. They gain strength when they are delivered in an applied, interdisciplinary manner in individual courses, in occupational clusters, through various schools of focus, or to all high school students. They gain power when the programs include school based learning, work based learning, and connecting activities.

The curriculum of a system of integrated academic and vocational education would be organized around academic and technical skills, and personal qualities delivered through situated learning. Instructionally, the curriculum would be delivered in an interdisciplinary fashion in academic as well as vocational classrooms. More collaboration would be required between vocational and academic teachers to devise thematic units, projects, and assessments so that connections between academic concepts and work requirements are established. Programmatically, this curriculum would be situated in both school based and work based learning environments. In the school based environment, such a curriculum could be delivered through vocational courses, vocational programs, or schools of focus. In the work based environment, such a curriculum could be enhanced through cooperative education and youth apprenticeships. Appropriate connecting activities such as career counseling, and service learning can be incorporated to make the link the two learning environments.

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Preface

In December 1993, the Metropolitan Educational Research Consortium (MERC) received the report on Work Force Preparation: A Review of the Literature. Following that review, MERC's Policy and Planning Council determined that no research was needed on the subject. However, during its 1996 study determinations, a renewed interest was exhibited in the connections of vocational and academic education. This paper updates our previous work and focuses more clearly on the integration of academic and vocational education as a way to improve educational services to all students. It addresses the following research questions:

- Why is it important to integrate academic and vocational education?
- What does the integration and vocational education mean?
- What are the essential components of integrated programs?
- What forms has integration taken? What examples of integrated vocational and academic strategies exist in practice?
- What evidence is there that these forms work? How effective has the integration of academic and vocational education been?
- What policy questions must be addressed to integrate academic and vocational education?

A study group was formed from MERC's membership to guide the research and disseminate its findings. They include: Jeff Baughman and Holly Rice - Chesterfield County Public Schools, Charles Davis and Cathy Bailey - Colonial Heights Public Schools, Linda Motley, Larkin Phillips, and Glenith Whitaker - Hanover County Public Schools, Howard Aderholt and Stacey Hipps - Hopewell Public Schools, Mac Beaton - Henrico County Public Schools, Kay Meredith - Powhatan Public Schools.

The Integration of Academic and Vocational Education

System Design

Vocational and academic education in U.S. high schools became separate entities around the turn of the century. Academic education has historically consisted of courses including English, history, mathematics, science, foreign language, and fine arts. Such an education prepares students for further education at the college or university level. Such an education may be supplemented with courses which familiarize students with the uses of technology. Occupational skills training has not been a component of academic education. Traditionally, vocational education has focused on specific skill training for entry-level jobs by offering students training in occupationally specific areas. While a large number of high school students do take vocational courses such as typing and keyboarding, academic students typically take a different sequence of courses than do vocational students (Bodilly, Ramsey, Stasz, and Eden, 1993).

A resurgence of interest in vocational aspects of American education has been generated as our nation struggles to meet the emerging needs of a changing economy. Sparked by the publication of *A Nation at Risk* in 1983, it has a become commonly held belief that many students were not acquiring the academic and technical skills required for many areas of the workforce. Many reforms have been offered to address these concerns, including curricular and pedagogical reforms, collaboration reforms, teacher collaboration reforms, as well as school transition reforms. In 1993, the Policy and

Planning Council of the Metropolitan Educational Research Consortium (MERC) sought to clarify the issues in a literature review of the work force preparation literature (McMillan, 1993). That review, conducted at the beginning of interest in this policy area, described the nature of the concern about how students are prepared for the work force, described the skills needed by workbound students, and extracted early lessons from schools leading the integration of academic and vocational education reforms.

Three years later, MERC's Policy and Planning Council, recognizing that the "new vocationalism" has brought with it a number of movements, each with its own ideas of how to respond to economic imperatives, once again commissioned a review of the integration of academic and vocational education. As is MERC's practice, the available literature was reviewed to identify what is already known about the integration of academic and vocational education. A search of the National Center for Research in Vocational Education, ERIC and WILS data bases was conducted. The search yielded 23 new sources since the 1993 review. The combined 50 sources, which form the data base for this review, are found in the annotated bibliography found in appendix A. It should be pointed out that there are few empirical studies. Most sources were either theoretical, anecdotal, or reviews of literature that focus on planning and approaches to implementing integrated academic and vocational education. However, they are useful to an audience attempting to provide such services.

The purpose of this paper is to identify and clarify important issues and themes related

to this issue, extract design components, and help formulate research questions which can be pursued through the collection of additional information. The questions which guided the search include:

- Why is it important to integrate academic and vocational education?
- What does the integration of academic and vocational education mean?
- What are the essential components of integrated programs?
- What forms has integration taken? What examples of integrated vocational and academic strategies exist in practice?
- What evidence is there that these forms work? How effective has the integration of academic and vocational education been?
- What policy questions must be addressed to integrate academic and vocational education?

Why is it important to integrate academic and vocational education?

The emphasis being placed on the integration of academic and vocational education has resulted from a series of perceived problems experienced by students who graduate from the existing divided system. These problems include poor basic and generic work-related skills, the inability to apply theory to practical problems, lack of engagement in school activities, as well as poor transition from high school to college or the workplace (Bodilly, Ramsey, Stasz, and Eden, 1993).

These concerns have been expressed not only prospective employers, but also policy

makers and analysts from outside the field of education (Goldberger and Kazis, 1996). For example, Stasz, Kaganoff, and Eden (1994), in a comprehensive review of the literature, identified eight reasons for modern efforts to restructure vocational education: (1) Improve academic content of vocational courses, (2) better prepare students for employment, (3) make U.S. workers competitive, (4) improve basic workplace skills, (5) increase student engagement, (6) utilize activity-based pedagogy, (7) increase access to both academic and vocational education, and (8) encourage teachers to collaborate.

These concerns have found their way into policy instruments which provide a historical view of the concerns and proposed policy solutions being advocated during the last decade and one half. The literature contains several markers of the move towards the "new vocationalism." For example,

- *A Nation at Risk* (1983) identified many basic skills that were found lacking among high school graduates in the United States. It focused attention on the question: Without the acquisition of basic skills, how will the American educational system produce individuals who will make a successful transition into a technologically advanced workforce?

- In 1988, the William T. Grant Foundation Commission on Work, Family, and Citizenship issued its report, *Forgotten Half*, which reminded us that more than half of all American high school graduates do not graduate from college. This fact spurred efforts to prepare students for the world of work and college (see

also reports from the National Assessment of Vocational Education (1989), and National Center on Education and the Economy (1990).

- The 1990 Amendments to the Carl Perkins Act supported a much broader connected view of vocational education for post secondary beyond the traditional focus on education for immediate employment. This broader view sees vocational education not simply for those students not pursing a college education. The amendments require that each program supported by federal funds integrate academic and vocational education through a coherent sequence of courses in order for students to become competent in both academic and occupational areas. Certain sections of the amendments lent support to Tech-Prep programs that combine high school and post-secondary education (usually in community colleges). A further provision promotes teaching about "all" aspects of industries students might enter in an effort to broaden students' content beyond job specific preparation (Grubb, 1996).

- The SCANS (1991) report, *What Work Requires of Schools*, published by the Secretary's Commission on Achieving Necessary Skills (SCANS) examined demands of the workplace and whether American students were prepared to meet such demands. The SCANS report concluded that a high skills workplace requires a range of skills beyond the basic reading, writing, math, listening, speaking skills. For example, SCANS determined that *thinking skills* (decision

making, problem solving, and knowing how to learn, and *personal qualities* such as responsibility, sociability, self-management, integrity, and honesty were required by the high skill workplace.

- The School-to-Work Opportunities Act of 1994 (STWOA), a joint initiative between the Departments of Education and Labor, was developed with a specific goal in mind: to ensure the success of youth entering the workforce by restructuring the education system to reemphasize the integration of academic and vocational education and adding a work based component. The legislation seeks to accomplish its goal by fostering a tripartite model of (1) school based learning where vocational and academic education is integrated through "career majors" linked to postsecondary education, (2) work based learning with "connecting activities," and (3) changes in instructional delivery which foster applied teaching and team-teaching strategies. Thus STWOA provides steps by which students may be provided with a learning atmosphere outside the classroom by utilizing workplaces as active learning environments (Krieg, Brown, and Ballard, 1995), and incorporating work-related skills in the school curriculum (Grubb, 1996).

What does the integration and vocational education mean?

An agreed upon definition of integration of academic and vocational education is elusive. Most writers in the field fail to provide a simple clear definition of what

integration of vocational and academic education. They more often simply indicate that it is needed, and then proceed to define it by describing what it might look like in practice. For example, the Perkins Act of 1984 simply says it means to organize the appropriate instructional and pedagogical practices into a single "integrated experiences to better prepare all students for the work force" In the 1990 Perkins Amendments (Section 240), the definition remains ambiguous. It simply requires the provision of a vocational program that "integrates academic and occupational disciplines." The amendments stipulate just one program design guideline - "that courses comprise "coherent sequences - and one program goal - that students achieve both academic and occupational competencies." (Stasz, Kaganoff, & Eden, 1994, p. 26)

The work of the Southern Regional Education Board is illustrative of this approach to defining the integration of academic and vocational education. They describes the chief characteristics of integration as: (1) challenging content, (2) teaching for understanding, (3) teachers working together, (3) teaching in a meaningful context, (4) setting clear performance standards, and (5) getting parent and community support and using their resources (Bottoms & Sharpe, 1996). They enhance their description by also describing what integration is not (see Table 1)

[Table 1 about here]

Table 1
An Integrated Academic and Vocational Curriculum

What it is	What it is Not
Challenging high-level mathematics, science, language arts, and technical studies.	A watered-down, "feel-good" curriculum with low-level academic content.
Students required to use information, rules, and facts in completing rigorous assignments.	Students asked to recall information, rules, and facts.
Students involved in all phases , from planning to evaluation.	Totally teacher-directed.
Students talking, thinking, planning, and doing.	Teachers lecturing.
Teachers working and planning together and taking collective responsibility for student learning.	Teachers working alone in a world of their own.
Projects that mean something to students and have value beyond the classroom.	Students learning facts and procedures without knowing why.
Demonstration as part of assessment.	Paper-and-pencil tests only.
Work critiqued by teachers, practitioners, and students.	Work critiqued only by teachers.
Teachers, students, and practitioners working together to create or adapt relevant learning experiences.	Teachers replicating units from other sources.
Career planning and preparation for a variety of careers and job levels within an occupational cluster.	Students preparing for dead-en, entry-level jobs and making no plans for employment beyond the first job.
Opening a world of options, including postsecondary education and/or employment.	Limited educational and career choices.
Greater parent and community support for high expectations for all students.	High expectations for college preparatory students; low expectations for career-bound students.
Students graduating from high school with educational and career plans, achievement documentation, a high level of technical and academic competence, and pride in their accomplishments.	"What are you going to do when you graduate?" "I dunno. Maybe go to college." "Why?" "What do you mean, why?" "I mean, why are you going to college?" "I dunno. Nothing else to do."

Source: Bottoms G., & Sharpe, D. (1996). Teaching for understanding through integration of academic and technical education. Atlanta, GA: Southern Regional Education Board. (p. 31).

While not the norm, there have been occasional attempts to specifically define the concept. For example, Brustein and Mahler (1994) define an integrated program as one which :

> . . . will provide students with applied and contextualized learning opportunities in both an academic and an occupational environment and in a manner that has direct relevance to a career major and occupational outcomes . . . A program consisting of applied methodologies, interdisciplinary teaching and team teaching strategies. . . . (Brustein & Mahler, 1994, p. 27).

Similarly, the California School Boards Association (CSBA, 1995) claimed that integration may currently be defined as "a coordinated instructional system of enhanced academic and technical education. This system promotes an understanding and application of knowledge and skills that prepares all students for lifelong learning and success in their life's work."

What are the essential components of integrated programs?

Armed with unclear definitions, the concept of integration, for the most part, has been left to the practical solutions found by policy makers, educators, and employers. Each of these constituencies has its own views of the curricular, pedagogical, or organizational problems that integration should address (Stasz, Kaganoff, & Eden, 1994, p. 28). For example, the school-to-work initiative (1994) describes integration as

having three essential components: work-based learning, school-based learning, and connecting activities. The initiative defined work-based learning as structured work experiences, mentoring, and instruction in industry-specific skills. Most work-based programs are designed to provide paid work experiences relevant to a student's career major, and led to an industry-recognized skill certificate. School-based learning includes high academic achievement and career counseling. Programs are tied to skill standards delivered through an integration of academic and vocational learning. Career exploration for students should begin no later than 7th grade with students selecting career majors by the 11th grade. Programs contain options for postsecondary training such as tech prep. Connecting activities are included which match students with employers and bring classrooms and workplaces together. Linking activities include offering training and technical assistance to employers and educators, recruiting business partners, and offering counseling and placement services to individual students (U.S. Department of Education, 1994).

A different approach was taken by Walker, Brower, and Wichowski (1995) in their effort to provide technical assistance for implementation of an integrated system. They operationalized the Braustein and Mahler definition by first defining the components, and then the essential elements of an integrated academic and vocational education system. Table 2 describes their eight components and examples of the essential elements which make up their instrument.

[Table 2 about here]

Table 2
The Components and Associated Elements of an Integrated Vocational and Academic Education

Component	Associated Elements (Selected)
Challenging and Coherent Program of Studies which prepares Career-bound Students for continued learning in an employment and educational setting	
Individualized advisement for career-bound students that use information and experiences as the basis for decisions about self, educational programs, and employment.	
School-based and work-based activity that fosters higher expectations for career-bound students.	In-school performance standards "benchmarked" against industry standards with students held accountable for these standards. (11 others)
Cooperation between academic and vocational educators to assist career-bound students to meet high performance standards.	
Extra help and extra time to assist career-bound students to complete a rigorous and coherent program of academic and vocational studies.	
Planned professional development for academic and vocational staff	
Various indices used to evaluate progress toward academic and vocational goals.	
Administrative support.	

Source: T. J. Walker, E. B. Brower, & C. P. Wichowski (1995). Changing schools from the inside out: Professional development through application of the SIAVE self-assessment. Philadelphia, PA: The Center for Vocational Education and Professional Personnel Development.

Their purpose was to determine the program and staff development needs to enhance the integration effort. They used this operational definition to assess the degree to which schools had implemented the essential elements, and then used the assessment data to "nurture the integration of academic and vocational education efforts" being conducted in the school districts they were working.

What forms have the integration of academic and vocational education taken?
Even though several attempts to define the integration of academic and vocational education have been noted above, the ambiguity of legislation and definitions has provided states and local school divisions the opportunity to tailor integration approaches to local needs and conditions. In fact, the National Assessment of Vocational Education (NAVE), which was mandated by the Perkins amendments, found that were so many different approaches to integrating academic and vocational education that it would be misguided to impose a single definition, or decide on one "best" approach to guide its assessments.

The burgeoning of approaches has, however, led several observers to attempt to classify the approaches. For example, Grubb, Davis, Lum, Plihal, & Morgaine (1991) proposed eight approaches, and McMillan (1993) chronicles seven approaches to the integration of academics and vocational education. Each of the approaches has several variants and differ in the extent to which the (1) curriculum, (2) teachers and/or teaching is modified, (3) students which are the target of the integrated programs are

changed, and (4) organizational changes are required.

The growing number of approaches has led several observers to try develop taxonomies to classify them for easier understanding. For example, Bodilly, Ramsey, Stasz, and Eden (1993) group the approaches into three broad strategies to achieve the integration of academic and vocational education: enhanced academics, enhanced relevance, and enhanced engagement. Enhanced academics can be achieved as vocational schools increase the academic content of their programs. Enhanced relevance can be achieved by providing students with practical experiences and education relevant to their future work in college and beyond. Such programs focus on science and/or technology and primarily serve college-bound students. Enhanced engagement can be achieved by restructuring the school organization to empower teachers to make curricular and pedagogical reforms.

Similarly, Stasz, Kaganoff, and Eden (1994) group approaches as curricular, pedagogical, or organizational. Curricular approaches respond to increasing basic skills and adding higher order skills and workplace skills to make students more competitive in the world economy or high tech workplaces of the future. Pedagogical approaches encourage academic and vocational teachers to share teaming methods so teaching and learning is improved in both academic and vocational classrooms. Organizational approaches seek to give all students access to both academic and vocational opportunities and limit the use of tracking.

Finally, Norton Grubb (1996), chronicled the history of the "new vocationalism" through five approaches to integrating academic and vocational education: (1) emphases on basic skills within the vocational education program, (2) emphasizing higher order skills withing the vocational education program, (3) redesigning deliver systems so that curricula are more relevant and applied, (4) incorporating employment-based learning outside of the normal school setting, and (5) integrating academic and vocational education. The first four approaches of the "new vocationalism" identified by Grubb are each quite different. The first is conservative, while the other three are reformist in nature. The first two approaches place emphasis on academics without the incorporation of vocational content. The third and fourth strands incorporate vocational content. The second approach is most insistent on changing teacher methods; the second and third place less emphasis on these delivery changes. The major problem seen with these four approaches is that each continues with the separation of academic program and vocational programs. The fifth approach, and most inclusive approach to the "new vocationalism" attempts to integrate academic and vocational education Integration through several strategies: (1) curricular reemphasis through the incorporation of more basic academic skills into vocational courses, (2) curricular expansion to include higher order skills, (3) curricular refocusing through the development of applied academics curricula that place focus on the applications of mathematics or writing or other communications skills in employment, and (4) curricular integration of academic and vocational skills for all students.

These approaches are easier to comprehend when discussed through the framework provided by the school-to-work initiative (1994): school-based learning, work-based learning, and connecting activities. For example,

School-Based Learning. School based approaches to integrating academic and vocational education has moved through several phases. The curricular phase, the instructional phase, and the program phase.

In the curricular phase, the emphases has been on what skills to teach. There are those that believe that the "new vocationalism," requires a renewed emphasis on curricular content and relevance if schools are to prepare well-informed citizens, and provide workers with the new skills required by a changing economy. This emphasis has been fostered by the rationales provided in the *A Nation at Risk* and *SCANS* reports. For example, *A Nation at Risk* identified a plethora of skills which had consistently declined in American students decades prior to 1981. Illiteracy and decreasing performance on student achievement tests were seen as major indicators of a decline in basic skills. Specifically, areas such as verbal comprehension, English, mathematics, science, and higher-order intellectual skills were found lacking. Remedial course work offered in public four-year colleges was but another indicator of the declining skills of American students.

Overall, *A Nation at Risk* presented proof that American high school students were graduating without acquiring basic skills which should be mastered before making the

transition to college or the workplace. However, despite the focus the report provided, little changed regarding the content of schooling. For example, *A Nation at Risk* proposed "new basics": English, math, science, social studies, and a half a year of computer science. The states responded by imposing higher academic standards in the form of new graduation and testing requirements. In essence, the major response was "more of the same." The same academic curriculum that has been taught since the 19th century has continued, albeit with a greater sense of urgency. While some improvements have been noted, these efforts to improve "basic skills" have not produced dramatic increases in student performance as measured on standardized achievement tests.

The SCANS report moved the conversation beyond the "basic skills." It reported that workplace "know-how" was seen as being composed of two elements: competencies and foundation skills. The five areas of competence that were identified are: (1) resources; (2) interpersonal; (3) information; (4) systems; and (5) technology. SCANS identified (1) basic skills; (2) thinking skills; and (3) personal qualities as the three elements of foundational skills.

The focal point of the report was built on the premise that high-skills workplaces of the future will require a range of basic skills (reading, writing, math, listening, speaking) as well as a range of thinking skills (decision making, problem solving, knowing how to learn). Additionally, personal qualities such as responsibility, sociability, self-

management, integrity, and honesty are required.

In the instructional phase, the focus was on how to deliver the skills. For example, SCANS pushed the discussion towards a **more relevant** curriculum by seeking to change instruction through more experiential learning outside of the classroom setting and through the incorporation of more situational learning. It was, and is, believed that teachers and schools must begin early on teaching students to identify the relationship between their studies and its applications to real-world situations. By pairing learning objectives with real environments, students are able to get a first-hand look and idea of what will be expected of them. Subjects such as reading and mathematics become less abstract and more concrete when embedded in one or more of the competencies required. In other words, learning needs to be incorporated into a system or a technological problem. Unfortunately, this approach focuses on self-selected vocational students and continues with the separation of vocational and academic tracks. Students emerge and are prepared for relatively unskilled entry-level jobs.

In the program phase, delivery models were identified to carry the new curriculum and teaching strategies. For example, curriculum integration, as well as tech programs, have proliferated with this approach. Some approaches focused on integrating classes such as applied physics. Other approaches focused on integrating vocational programs such as Tech Prep. And still other approaches attempted to integrate high schools so that the opportunities for integration are more consistent. The literature

contains several markers of the efforts of schools to integrate academic and vocational opportunities through curricular revisions, instructional strategies and program components. For example,

Curricular Restructuring

In the curricular restructuring approach to integrating academic and vocational education, reforms are made in vocational courses, academic courses individually, or simultaneously.

- Integrating more academics in vocational courses. In this approach, academic curriculum and standards are similar for all high school students. Vocational course content is changed to reflect more academic learning, e.g., increased emphasis on oral and written communication skills, high level mathematics concepts, and science concepts (McMillan, 1993). Vocational teachers incorporate more academic content in vocational courses through the use of newly developed commercial curriculum material, or through the development of model curricula. Courses would either continue to be taught by vocational education instructors (Grubb, Davis, Lum, Plihal, & Morgaine, 1991), or academic and vocational teachers work together to develop and implement applied learning (McMillan, 1993).

- Integrating more vocationally relevant concepts into academic courses. Academic courses would be made more vocationally relevant (Grubb, Davis, Lum, Plihal, & Morgaine, 1991). The key components to this approach are to: (1) emphasize workplace skills, (2) insert more occupationally relevant material, (3) emphasize applied learning in academic courses, and (4) contextualize learning. Courses would either continue to be taught by academic instructors, or academic and vocational teachers work together to develop and implement applied learning (McMillan, 1993).

- Modifying both academic and vocational education curricula. More occupational-relevant material would be presented in academic courses and more academic education would be presented in vocational courses (Grubb, Davis, Lum, Plihal, & Morgaine, 1991). Inserting more relevant workplace skills in all types of courses. This involves a restructuring at the classroom level to emphasize to a

greater extent higher-order thinking skills, problem solving skills, metacognitive skills, and so on (McMillan, 1993).

Course Delivery Modifications

In the course delivery approach to integrating academic and vocational education, teachers collaborate in the development and delivery of revised curricula.

- Interdisciplinary Delivery: Both academic and vocational teachers collaboratively modify their delivery of vocational programs (Grubb, Davis, Lum, Plihal, & Morgaine, 1991). Such classrooms often include project-based learning, authentic problems, and cooperative learning (McMillan, 1993). In some cases, two or more teachers from both sides would be linked in order to coordinate the content of what they teach at a given time. This would serve to create sequences of academic and vocational course-work that reinforce each other (Grubb, Davis, Lum, Plihal, & Morgaine, 1991).

- Thematic Projects or Units: Projects focus on a occupational cluster, or connect into a school wide project. For example, students connect math, science , social studies, and language arts to planning, designing, building, testing, and evaluating of products such as robots, or houses.

- The Senior Project: Some schools have institutionalized thematic projects through a required senior project which may require a research paper, a physical project, and an oral presentation. Project examples include: ancient Roman plumbing, use of computers in a travel agency, the historical significance of political illustrations, windmills and electricity, and new refrigerant technology. In the projects students are forced to integrate learning from various courses. Some schools have revised curricula in order to prepare students for their independent efforts during the school year.

Program Restructuring

In the program restructuring approach to Integrating academic and vocational education, reforms are made to entire programs rather as opposed to an individual course (Grubb, Davis, Lum, Plihal, & Morgaine, 1991).

- Integrating more academic courses into vocational programs. This approach

involves requiring vocational education students to take a greater number of higher level academic courses. The key components to this approach are to: (1) raise the academic course expectation level, and (2) emphasize applied learning in academic courses. Academic curriculum and standards are similar for all high school students; academic and vocational teachers work together to develop and implement applied learning (McMillan, 1993).

- Tech Prep. Tech Prep programs align the last 2 years of high school with the first 2 years of college or technical school in specific occupational areas. Commonly referred to as the "2+2" program, Tech Prep programs typically have strong applied academics focus and limited work experience components. Their focus is on improving the transitions from high school vocational programs to more advanced postsecondary programs in the same occupational area. The program should be grounded in an integrated, authentic, and highly relevant core curriculum, be well articulated with postsecondary education, focused on increased student performance, and be implemented with a highly collaborative approach (Bragg, Layton, Hammons, 1994). It requires coordinating course content, reducing duplication, and upgrading the status of some high school students (McMillan, 1993).

- Occupational Clusters. Occupational clusters require that students choose a cluster or career path (major) around the tenth grade. Clusters are usually board occupational or industry-based groupings that reflect local labor markets and structures. The remaining two or three years of high school are structured accordingly. In some schools, at the tenth grade the occupational cluster replaces the academic and vocational education departments. Other schools operate on a matrix structure where the traditional vocational and academic departments are retained, but students and teachers are organized in career paths or elect occupational majors. Clusters can combine students from different backgrounds with different occupational ambitions. This serves to reduce the usual segregation of college-bound and vocational students (Grubb, Davis, Lum, Plihal, & Morgaine, 1991).

- The Career Academy: Career academies operate as schools-within-schools. In such schools four teachers collaborate: one each in math, English, science, and the occupational area (i.e., health, electronics, business, agriculture) that defines the academy. An essential component of these schools is that a group of teachers works with a group of students over a number of years. A second important element in career academies is the development of close relationships with firms operating in the occupational area of the academy. These partnerships provide students with additional motivation, mentors, and internships (Grubb, Davis, Lum, Plihal, & Morgaine, 1991).

- High Schools that Work (HSTW). HSTW seek to raise the achievement of career bound high school students to the national average of all students. HSTW targets students who plan to work, enter the military, or attend a two-year postsecondary college or a four year college with open admission. The centerpiece of HSTW is a curriculum which blends essential content of college preparatory mathematics, science, language arts and social studies courses with modern vocational studies in grades 9-12. Students who meet three performance goals (reading, math, science proficiency), and three of four curriculum goals (English-4 credits, math-3 credits, science-3 credits, vocational-4credits) receive a certificate of educational achievement.

- Occupational high schools and magnet schools. Occupational and magnet high schools are similar to career academies and clusters, except the programs are school wide. Occupational high schools and magnet schools emphasize preparation for vocations in a particular area. Each students within an occupational school is enrolled in a curriculum incorporating courses related to the magnet's focus. The premise is that both academic and vocational education can best integrated in a culture which emphasizes the occupational content of course work (Grubb, Davis, Lum, Plihal, & Morgaine, 1991).

- Merger of vocational and academic tracks intro a single program for all students. Students are exposed to an upgraded common core of academic courses that prepare all students for postsecondary education. The "general track" is eliminated and students are required to complete a vocational or academic concentration and college preparation (McMillan, 1993).

Work-Based Learning

Work-based learning approaches reemphasize the integration of academic and vocational education, while adding a work component. Initially, work-based learning was delivered through "stand alone" apprenticeship type programs. However, with the implementation of the School-to-Work Opportunities Act of 1994, these programs have become tripartite in nature and incorporate school-based learning (in which academic and vocational education are integrated within "career majors" and are linked to at least one year of post-secondary education); a work-based component; and connecting activities to make the school-based learning consistent with work-based learning. This

approach calls for the use of applied teaching methods as well as team-teaching strategies.

The initiative defined work-based learning as structured work experiences, mentoring, and instruction in industry-specific skills. Most work-based programs are designed to provide paid work experiences relevant to a student's career major, and lead to an industry-recognized skill certificate.

While the concept has garnered much attention for its ability to reform the delivery of education, Grubb (1996) believes that two other more limiting outcomes are possible with the school-to-work reform. For example, one outcome may be that "work experience" programs in which certain high school students (particularly those considered "at risk") will spend time in work placements. This approach would only replicate programs that garnered support in the 1970s. The other potentially limiting outcome would occur if high quality school-to-work programs were developed for a small number of students, thus leaving the college-prep and the general tracks relatively unchanged.

While Grubb's concerns may come to fruition, the initiating legislation is too new to make predictions about the future direction of school-to-work programs. The literature contains several markers of the efforts of schools to provide work-based learning opportunities. For example,

- Cooperative Education. Cooperative education programs are administered by a school coordinator, and provide students with part-time jobs during the school year in their chosen vocational field. The program includes a training plan that clearly specifies what the student is expected to learn on the job.

- Youth Apprenticeships. Youth apprenticeship programs integrate and coordinate work-based and school-based learning. The active participation of employers is required. Employers generally provide paid work experiences and structured worksite learning while schools integrate academic and vocational learning. Apprenticeships generally last 2 years. They should be structured to break down the barriers between academic and vocational programs, and should build bridges to postsecondary education. Successful programs also include common generic skill learning objectives for all apprenticeships leading to industry based certification.

Connecting Activities

Connecting activities are included which match students with employers and bring classrooms and workplaces together. Linking activities include offering training and technical assistance to employers and educators, recruiting business partners, and offering counseling and placement services to individual students (U.S. Department of Education)

- Career counseling. Career counseling programs are tied to skill standards delivered through an integration of academic and vocational learning. Career exploration for students should begin no later than 7th grade with students selecting career majors by the 11th grade. Programs contain options for postsecondary training such as tech prep.

- Service Learning. Programs in which students learn through meaningful community service opportunities such as tutoring, working with the elderly, or volunteering at hospitals. Students reflect on their experiences through structured classroom activities.

What evidence is there that the integration of academic and vocational education will be a useful reform?

The benefits of integrating academic and vocational education are widely acclaimed.

For example, "desired student outcomes--such as improved learning, engagement, and school transition - have been reported but not substantiated."(Stasz, Kaganoff, & Eden, 1994, p. 37). Most observers follow the line of reasoning offered by Walker, Brower, and Wichowski. Their working hypothesis was:

> "if," integrated curricula were in place at some level, "then," a level of student outcomes would result (e.g., a level of math scores, employer satisfaction with new employees, technical skills, and the like). What follows is that "if" there is increased 'use of integration, "then" increased math scores, increased employer satisfaction with new employees, increased technical skills, and the like should result (p. 9).

However, like others, they did not test their hypothesis. Stasz, Kaganoff, and Eden, (1994) after a comprehensive review of one hundred sources concluded,

> The few evaluation studies we identified provide little hard evidence that participation in an integrated program affects student learning. Nearly every study had serious methodological or conceptual flaws that cast doubt on reported findings. . . (p. 42).

However, they go on to say that recognizing the shortcomings of the literature, "available evidence on student outcomes suggest that occupationally-oriented high schools and career academies can raise academic learning, reduce drop out rates, and instill positive career-related aspirations for students enrolled. These models of

integration seem the most promising, but are also the most ambitious in that they require a vision that encourages substantial changes in more traditional forms of schooling." (p. 61-62)

An earlier study conducted by Bodilly, Ramsey, Stasz, and Eden (1993) through NCRVE examined the integration of academic and vocational education in eight schools that implemented integration efforts a few years prior to the Perkins amendments. The sites in this study sought to reform curricula through increased course content, improved course alignment and content connections, and improved workplace-related skills and attitudes. The sites also attempted to incorporate hands-on problem-solving, cooperative or team-based activities, lessons requiring multiple forms of expression, and project work drawing on knowledge and skills from several domains. All sites in the NCRVE study reported major barriers to reform, including existing regulations, inadequate funding, lack of adequate existing materials, and a lack of support for teacher's efforts. Despite enthusiasm and commitment, a lack of funding eventually led to teacher resentment and burnout. This was interpreted by teachers as a signal that integration was not considered important. Further, two key elements to transition efforts emerged: (1) involvement of external factors (such as parents and members of business community); and (2) curricular and pedagogical reforms making the school experience resemble adult work.

Two recent studies (Pauly, Kopp, and Haimson, 1994; American Youth Policy Forum-

Jobs for the Future, 1995) reported on a national sample of 21 school-to-work programs. Their supportive conclusions include: Programs have increased in number and types of students and schools involved. it will require a major effort to recruit employers to meet the potential needs of such programs.

There seem to be many reasons to implement a system of integration and few drawbacks. For example, Stasz, Kaganoff & Eden (1994) report that changes in teachers responsibilities have resulted in the only reported negative outcomes of integration. These normal implementation concerns result from working with students from different skill levels such as the need for more planning time and additional training. Other concerns were noted such as resistance to working with low academic achievers and students from different skill levels as more long lasting and difficult to remedy.

What policy questions does the integration of academic and vocational education present?

Policy makers have to make choices. In the case of the integration of academic and vocational education, they have to make choices in pursuing or not pursing such a strategy. They need to make choices of what they want to integrate, and they need to make choices about the scope of their implementation. For example, the National Governors' Association (1994, p. 3) described three scenarios which reflect choices which policy makers have to make in implementing integration of academic and vocational education. These choices are: should all students have access to an

integrated program?, or should all general students have access to an integrated program?, or should some students in some specialized tracks have access to integrated programs? They described these policy questions through three possible scenarios integration of academic and vocational education might proceed:

- School-to-work transition will become the basis for restructuring of all levels of education, promoting school reform, and improving student performance.
- School-to-work transition will become the basis for reforming education for students in the general track, with college preparation and special education left untouched.
- School-to work-transition will result in a series of programs added to the general curriculum.

However, even prior to selecting the scenario, policy makers should consider the factors in their environment which he conclusions drawn by Bodilly and her colleagues and reinforced by McMillan (1993) can be used by potential implementors as preconditions which must be present prior to pursing the integration of academic and vocational education programs. For example,

- Integration is seen as applicable to all types of high schools. While federal efforts focus on support for schools receiving Perkins funding, all schools and all students can benefit from an integrated academic and vocational program.
- Integration is seen as school wide improvement effort. Once decision makers agree on the scope of the integration (see policy maker scenarios), the effort will benefit if pursued as a school improvement initiative with appropriate changes in curriculum, delivery, and program structure with clear support from the board of education and the superintendent.
- There is a willingness on the part of policy makers to grant the Integration

strategy up to five years to produce exemplary results. Depending on the scenario chosen, the integration of academic and vocational opportunities can take up to five years to see the expected results. The process should be continuous with formative assessments being used to guide the implementation.

- There is a willingness to connect the integration strategy to other systemic reforms occurring in the school. Implementation of an integrated program is easier when it is see as part of other reforms such as curricular frameworks and monitoring that are being pursued by schools.

- There is a willingness to create a conducive regulatory environment to support the implementation of the strategy. Existing policies (particularly time, space and accessibility) should be examined to determine their compatibility with the integration strategy being pursued.

- There is a willingness to invest appropriate resources in the Integration strategy. Resources must either be redirected or added to foster the implementation. Inducements as well as capacity building strategies which promote integration should be considered.

- There is a willingness to rethink present education conventions. Policy makers, employers, teachers, parents and students must be willing to withhold criticism until the integration has been complete and can be evaluated.

Once it is determined that these preconditions exist, policy makers will be helped in designing their system of integration from the concepts found in this paper. We have summarized these options in Table 3.

[Table 3 about here]

Table 3
A Taxonomy of Integration Goals, Approaches, and Observed Positive Outcomes Reported in Literature to Date

	Goals	Approaches	Observed Positive Outcomes*
Enhanced Academics	1. Improve academic content of vocational courses. 2. Improve basic workplace skills.	1. Incorporate more academic content in vocational courses. 2. Modify both academic and vocational education, curricular "alignment."	1. Integration of academic and vocational content. 2. Increase teaching of generic skills. 3. Claims of improved student achievement.
Enhanced Relevance	3. Better prepare students for employment. 4. Make U.S. workers more competitive. 5. Increase access to both academic and vocational education. 6. Increase student engagement.	3. Make academic courses more vocationally relevant. 4. Integrating more academic courses into vocational programs 5. Senior projects. 6. Academy model. 7. Occupational clusters, majors, and career paths 8. Occupational and magnet schools. 9. Merge vocational and academic tracks into a single program for all students. 10. Cooperative Learning 11. Youth Apprenticeships 12. Service Learning	4. Changes in organizational structure to facilitate integration. 5. More students go on to postsecondary education. 6. Less separation of vocational and academic students. 7. Greater self -esteem for vocational students. 8. Increased school participation and reduced dropouts.
Enhanced Engagement	7. Encourage teachers to collaborate. 8. Utilize activity-based pedagogy.	13. Combine academic and vocational teachers to incorporate academic content into vocational programs. 14. Career Counseling	9. Increased collaboration between academic and vocational teachers. 10. Improved pedagogy. 11. Improved guidance and counseling functions.

*Source for outcomes: Stasz, C., Kaganoff, T., & Eden, R. A. (1994). Integrating academic and vocational education: A review of the literature, 1987-1992. Journal of Vocational Education Research, 19(2), p 39.

CONCLUSIONS

After reviewing the literature on the integration of academic and vocational integration, we have concluded that the lack definition has led to numerous promising approaches, expanding claims, and little evidence of effectiveness. We also believe that as the movement has proceeded, the initiating concerns of policy makers and business have been lost in attempts to implement a "fuzzy" concept. As practitioners have "grappled" with implementing such a system it appears that more effort has been placed in putting something in place, and many times the intent of such a system of integrated academic and vocational education has been left to individuals and groups of individuals to define. As a result it can safely be said that few coherent integrated systems of education can be found in our schools today. However, the literature recognizes some innovative efforts to bring such a system to fruition such as the Southern Regional Education Board's "High Schools That Work" initiative.

Therefore, we close this paper with our interpretation of how an integrated system of academic and vocational education could be developed, once local policy makers decide to move in this direction. It is our belief that policy makers should first assess the preconditions we mentioned earlier and then decide if an integrated system will be delivered through a course, program or a school to some students or all students. This decision should be followed with the development of an instructional guidance system which (1) aims at raising achievement by involving students in more challenging

curriculum content through adopting curricular frameworks, instructional materials, student testing, and teacher training, and (2) insures that students are exiting school with desired skills. Such an instructional guidance system should begin with (1) a clear definition of what is expected of students, (2) curricular frameworks which organize this expectation into sequential curricula and instructional materials, methodologies, and assessments, and (3) an individual and program monitoring system which accounts for the delivery of the system.

Definition

The basic components to be contained in an instructional guidance system are found in the following definition of an integrated academic and vocational education.

> An integrated system of academic and vocational education is one which provides students the opportunity to learn the appropriate academic and technical skills required in the workplace. It also encourages growth in a system of personal values which are conducive to developing a work ethic. These curricular concepts gain coherence when they are organized into career majors and occupational clusters. They gain strength when they are delivered in an applied, interdisciplinary manner in individual courses, in occupational clusters, through various schools of focus, or to all high school students. They gain power when the programs include school based learning, work based learning, and connecting activities.

Curricular Framework

The curricular framework which guides the delivery of an integrated system of academic and vocational education would be organized around the following curriculum, standards, and indicators.

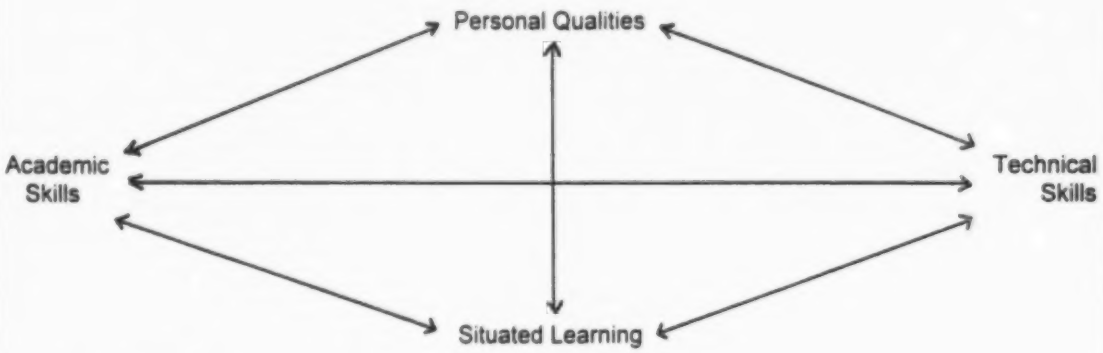
Curriculum. A successful model of integration of academic and vocational education would be organized around academic, technical, and personal qualities and delivered through situational learning. The review of the literature suggested that students prepared through straight academic or vocational programs are not being adequately prepared for the workforce. The skills now needed include not only academic and vocational skills, but a host of interpersonal skills as well. Since the publication of *A Nation at Risk*, our country has had the perception that there has been a steady decline in the academic skills of our high school students, and our students were lacking in many basic areas. It therefore stands to reason that any successful model of integration must have as one of its major components an academic skills assessment that portrays the accurate performance of students. Students must demonstrate proficiency in basic academic skills. This proficiency will enable students to make a successful transition to many areas of the work arena. However, just the acquisition of basic skills is not enough to meet the needs of tomorrow's work place. For example, managerial/executive skills (seen as part of interpersonal skills development) may make a major difference where one is in the workforce. The integration of academic, technical and interpersonal skills development is central to an adequate school model.

Another factor which merits consideration in the development of a successful model is situated learning. Exposing students to various job-settings or situations may aid in students' understanding of the importance of integrating the abovementioned skills. The integration of academic, technical and interpersonal skills development is central to an adequate school model.

Based on our review, an integrated academic and vocational education program would attempt to develop and deliver a curriculum based on three components: academic, technical, personal qualities delivered in an applied, contextual manner. The curricular components are pictured in Figure 1.

[Figure 1 about here]

Figure 1
Components of an Integrated Academic and Vocational Education Curriculum: Foundational Skills and Exiting Competencies



Academic Skills refer to the basic, and thinking, skills required in the workplace. They include the development of competence in (1) reading, writing, mathematics, speaking, and listening, and (2) thinking creatively, making decisions, solving problems, knowing how to learn, and reasoning (SCANS, 1991).

Technical skills refers to skills required in the workplace. They include (1) resource allocation skills - how workers allocated time, money, materials, space, and staff, (2) information skills - how workers acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information, (3) interpersonal skills - how workers participate on teams, teach others, serve customers, negotiate, resolve conflicts, and lead, (4) system skills - how workers see connections among disparate parts of organizations, projects, and people; monitor and correct system performance; and design and improve systems, and (5) technology skills - how workers select and apply technological tools to specific tasks (SCANS, 1991).

Personal Qualities refers to development of nine core American values that students should learn, including: (1) Democracy is right. Authoritarianism is wrong, (2) Honesty is right. Dishonesty is wrong, (3) Responsibility is right. Irresponsibility is wrong, (4) Freedom of speech is right. Restricting freedom of speech is wrong, (5) Courtesy is right. Discourtesy is wrong, (6) Tolerance is right. Intolerance is wrong, (7) Freedom of worship is right. Restricting freedom of worship is wrong, (8) Respecting the law is right. Violating the law is wrong, (9) Integrating schools is right. Segregating schools is wrong. (Frymier, Cunningham, L., Duckett, W., Gansneder, B., Link, F., Rimmer, J., and Scholz, J. 1995).

Situated Learning refers to learning which results from applied contextualized delivery of the intended curriculum. Such learning takes place in schools, community and work places. For example, with the cooperation of the local business community in a given area, a school system can help expose students to a variety of settings or situations in order to better prepare them for the transition from work to school (STWOA, 1994).

Delivery. Instructionally, the curriculum would be delivered in an interdisciplinary fashion in academic as well as vocational classrooms. More collaboration would be required between vocational and academic teachers to devise thematic units, projects, and assessments so that connections between academic concepts and work requirements are established.

Programmatically, this curriculum would be situated in both school based and work based learning environments. In the school based environment, such a curriculum could be delivered through vocational courses (thematic units and projects), vocational programs (Tech Prep, HSTW, Occupational Clusters, Career Academies), or schools of focus (Occupational and Magnet high schools). In the work based environment, such a curriculum could be enhanced through cooperative education and youth apprenticeships. Appropriate connecting activities such as career counseling, and service learning can be incorporated to make the link the two learning environments.

Standards and Indicators. School divisions would develop standards and indicators which could be measured to determine the level of integration of the academic and vocational educational system, and could be eventually used to determine the effectiveness of the system as it relates to student performance. Such a set of standards might resemble the standards and indicators found in Table 4.

[Table 4 about here]

Table 4
Standards and Indicators of Work-based Learning, Connecting Activities, and School-Based Learning

Work Based Learning
Students spend more time in training and employment settings

- Students spend up to ten hours per week gaining onsite exposure to selected occupations.
- Students spend four hours per day in academic classes and four hours in apprentice roles.

Students earn wages and college credits as part of their program

- Students earn up to 25 hours of college credit for first 2 years of work.
- Students earn industry approved skill certificates.

Connecting Activities
School representatives work with business, non-profit organizations, government, technical and vocational schools, community colleges and universities to develop, implement and assess school-to-work opportunities for students.

- Mechanisms exist to help students find tutors, mentors, and job coaches.

Schools change the way they track and place students by experimenting with upgraded classrooms and other grouping alternatives.

- Untracked, self-paced, self-directed "universal high performance education" exists for all K-10 students.

School Based Learning

Schools adopt curricular frameworks which center on provision of academic and technical skills, and personal qualities in situated learning environments.

Schools provide individualized options for training.

- Curriculum is reorganized around six career paths such as business marketing and management, technology, creative and applied arts.

Teachers structure classroom activities to integrate academic skills with skills required for successful employment.

- Learning is more contextualized. (I.e., students in English and business classes with a business plan, students in electronics class use principles of chemistry and physics to learn how timing circuits work.
- Academic subjects become more applied.

Teachers and counselors provide information about careers and school-to-work opportunities to parents and students and help them make decisions based on their knowledge of the curriculum and students' interests and aptitudes.

- Students meet with counselors, teachers, and parents to explore careers, exchange information and create education and occupation plans.
- Career labs offer assessment tools and information on labor markets and occupations via computers.
- Students choose a career path and devise a course plan to employment.

Teachers form partnerships with business people, technical workers, and others from the public and private sectors to provide resources and enhance classroom experiences.

- Teachers co-teach with industry specialists
- Students "job shadow " prior to selecting career path.
- Mentors from businesses help students understand the relationship between what they are learning in school and work sites.

Teachers broaden and deepen their knowledge of various vocations in order to contextualized learning activities and to set achievable goals for their students.

- Teachers participate in paid summer work internships to gain insights into the workplace.
- Teachers shadow professionals in other occupations.
- Teachers participate in professional development opportunities with professionals in other occupations.

Teachers use new ways to assess student knowledge and skills in order to help students meet state and industry standards.

- Teachers use project based approach which approximates the work environment.
- Students collaborate on projects with multiple tasks and deadlines.

System Performance. The instructional guidance system which supports the integration of academic and vocational education for a given school or school district could be assessed in several ways. First, the system could be measured against the standards and be used as a formative evaluation in continuously improving the program design and delivery. For example, teacher observations, interviews and surveys could also provide program and staff development needs.

Second, system performance can also benefit from biannual assessments of the progress being made towards integration. For example, the system could be benchmarked by the standards through a "level" approach. In the level approach an individual course, program, or school would be classified as having attained a certain tier of integration based on how well the integration process has taken place. The following descriptions of levels are only illustrative and given to demonstrate the level concept.

- **Level One**: Level one integration is achieved when schools have installed the curriculum framework into at least two courses. They must have integrated more academic skills in vocational classes and more technical skills in academic classes. At this level of integration, a series of courses must be designed for students of particular career clusters. Teachers in those courses, which are integrated, are collaboratively delivering the curriculum framework. Thematic units have been established in those courses. Level 1A has been achieved when courses contain school based and work based learning, and connecting activity components. Level 1B has been achieved when students in these courses have demonstrated competence on exit requirements.

- **Level Two:** Level two integration is achieved when level one has been achieved for all courses offered by the vocational program, and the vocational courses have been packaged into occupational and career clusters which reflect local labor markets. schools have installed the curriculum framework into all programs. Level 2A has been achieved when two courses in the program contain school based and work based learning, and connecting activity components. Level 2B has been achieved when all courses in the program contain school based and work based learning, and connecting activity components. Level 2C has been achieved when students in these programs have demonstrated competence on exit requirements.

- **Level Three:** Level three is achieved when levels one and two have been achieved, and are delivered through school structures conducive to developing a supportive environment. For example, schools have adopted a career academy, HSTW, or magnet approach to delivering their integrated program. Level 3A has been achieved when career academy approaches have been utilized. Level 3B has been achieved when all a schools of focus approach has been utilized. Level 3C has been achieved when students in these schools have demonstrated competence on exit requirements.

- **Level Four**: Level four has been achieved when levels one and two have been achieved, and vocational and academic tracks have merged into a single program for all students. For example, all students are exposed to an integrated common core of courses which prepare them for postsecondary education. Students are required to complete a vocational or academic concentration in preparing for postsecondary education. Level 4A has been achieved when all students have demonstrated competence on exit requirements.

Third, system performance must be judged against student achievement and job performance. In this phase, the acquisition of academic, technical, skills, personal qualities by students would be measured to determine if the progress the course, program or school is making toward integration results in improved student achievement and job performance. For example, in order to make the link between academics and career, a given group of working students from integrated programs may be chosen from each school to participate in assessing how well a given level of

integration aids in job performance. In the area of student achievement, such assessments are common. Existing student assessment programs such as the TAP ASFAB, and SAT tests could be examined to determine if they meet the requirements of the curricular frameworks. Or, specific achievement tests geared to the curriculum frameworks could be developed. While this is a more costly option, in the long run it would be the more appropriate option.

Job performance evaluation is more of problem since it has few predecessors's in the assessment vocabulary of school level personnel beyond employer survey's. Several examples should help flesh out the concept. For example, one could choose a select group of students who work for one or several types of businesses within the community and speak to their employers about various jobs skills required for positions held by such students. The performance may then be rated by employers. This assessment may then be compared to the work performance of students coming from a non-integrated school or from a school with a different level of integration. One may then be able to determine the relationship of skills being taught in an integrated program to the success of getting a job.

An alternative would be to follow a group of graduating students who have completed several years of an integrated program to determine their success in the workplace. This strategy, however, may not be feasible because of the time factor involved. And further, some of these students may have plans for college. This would be further

confounded by skills learned or attained in college. However, a longitudinal approach would provide the most appropriate measure of program success.

In summary, the literature review presented both problems and opportunities for professionals working in the area of vocational education. The problem it presents is a "fuzzy" literature with few certainties. The opportunity it presents is a "fuzzy" literature with few certainties. Within this ambiguity, we found the components of an integrated academic and vocational education program. Building on the literature, we offered the outlines of a curriculum framework which would clarify the intentions of an integrated system of academic and vocational education, and a monitoring and assessment system which would demonstrate its value in producing students with workplace skills. We offer this description of an integrated system of academic and vocational education as a beginning point for school divisions embarking on this promising path.

REFERENCES

Bottoms, G., & Sharpe, D. (1996). Teaching for understanding through integration of academic and technical education. Atlanta, GA: Southern Regional Education Board.

Bodilly, S., Ramsey, K., Stasz, K., & Eden, R. (1993). Integrating academic and vocational education: Lessons from eight early innovators. University of California, Berkeley, CA: National Center for Research in Vocational Education.

Bragg, D. (1994). Building a preferred future with Tech Prep systems. Berkeley, CA: National Center for Research in Vocational Education (ED 375 297).

Brower, E. B., Walker, T. J. & Wichowski, C. P. (1994). The SIAVE assessment: Determining the status of the integration of academic and vocational education. Philadelphia, PA: The Center for Vocational Education Professional Personnel Development.

Brustein, M. & Mahler, M. (1994). AVA guide to the school-to-work opportunities act. Alexandria, VA: American Vocational Association

Burns, R., & Sattes, B. (1995). Dissolving the boundaries: Plan for curriculum integration in middle and secondary schools. Charleston, WV: Appalachia Educational Laboratory (ED 384 455).

California School Boards Association (1995). Increasing rigor and relevance: Linking school-to-career: Best school practices. Sacramento, CA: California School Boards Association.

Ciemanec, K., & Boston, C. (1996). School-to-work transition in the k-12 classroom. The ERIC Review. 4(2), 12-13.

Frymier, J., Cunningham, L., Duckett, W., Gansneder, B., Link, F., Rimmer, J., and Scholz, J. (1995). A study of core values and the schools: Final report. Bloomington, IN: Phi Delta Kappa.

Goldberger, S., & Kazis, R. (1996). Revitalizing high schools: What the school-to-career movement can contribute. Phi Delta Kappan (April), pp. 547-554.

Grubb, W.N. (1996). The new vocationalism: What it is, what it could be. Phi Delta Kappan (April), pp. 535-546.

Grubb, W. N., Davis, G. Lum, J., Plihal, J., & Morgaine, C. (1991). The cunning hand, the cultured mind: Models for integrating vocational and academic education (Report No. MDS-234). Berkeley, CA: National Center for Research in Vocational Education.

Grubb, W.N., & Stasz, C. (1992). Assessing the integration of academic and vocational education: Methods and questions. University of California, Berkeley: National Center for Research in Vocational Education.

Krieg, F.J., Brown, P., & Ballard, J. (1995). Transition: School to work. National Association of School Psychologists.

National Commission on Excellence in Education (1983). A nation at risk: The imperative for educational reform. Washington, D.C.: National Commission on Excellence in Education.

National Governors' Association (1994). Developing systems of school-to-work transition: A report on state progress. Washington, DC: National Governors' Association. (ED 374-223).

Stasz, C., Kaganoff, T., & Eden, R.A. (1994). Integrating academic and vocational education: A review of the literature, 1987-1992. Journal of Vocational Education Research, 19(2), pp. 25-72.

U. S. Department of Education (1994). School-to-work opportunities: Common questions, with answers. Washington, DC: U.S. Department of education.

U.S. Department of Labor (1991). What work requires of schools: A SCANS report for America 2000. Washington, D.C.: U.S. Department of Labor.

Walker, T. J. (1995). Changing schools from the inside out: Professional development through application of SIAVE self assessment. Paper presented at the American Vocational Association Convention (Denver, CO, December, 2, 1995 (ED 394 071).

ANNOTATED BIBLIOGRAPHY

The purpose of this annotated bibliography is to summarize important recent literature pertaining to the integration of academic and vocational education. It has been prepared by the Metropolitan Educational Research Consortium to provide a context for proposing a research study for the successful integration of academic and vocational education. Each source is on file at the Metropolitan Educational Research Consortium office at Virginia Commonwealth University, and all are available to members of the Consortium.

An assessment of American education: The view of employers, higher educators, the public, recent students, and their parents. (1991). New York: Louis Harris & Associates, Inc.

This is a large-scale national study of the quality of education in relation to preparing all students for work or higher education. Employers, recent students, higher education officials, and other adults were surveyed. The survey identified 15 "key attributes" to either enter higher education or the work force, and respondents indicated on scales their perception of how well students were prepared in each area. The 15 attributes included working cooperatively, desire to learn, good attitudes in dealing with others, dress and behavior, ability to read, capacity to concentrate over extended time periods, motivation, mathematical ability, work ethic, writing, problem-solving. The results indicate significant concern that students are not well prepared in these areas.

Ascher, C. (1994). Cooperative education as a strategy for school-to-work transition. Center Focus 3. (Electronic copy through http://vocserve.berkeley.edu/CenterFocus/cf.html)

The article identifies barriers which must be over come before cooperative education can be used as a model for expanded school-to-work transition efforts. It also offers the findings of research related to successful cooperative education programs.

Author (March, 1994). Vocational Education Journal. 69 (3).

This issue of the journal presents eight articles which focus on the theme of school-to-work transition. Information is included about work-based education, youth apprenticeships, cooperative education, tech prep, and innovative programs.

Bailey, T. & Merrit, D. (1993). Youth apprenticeship: Lessons from the U.S. experience. Center Focus 1. (Electronic copy through http://vocserve.berkeley.edu/CenterFocus/cf.html).

The article compares components of youth apprenticeship programs with school-to-

work program models, including agriculture education, cooperative education, career academies, and tech prep. It describes how the components would work in each program model.

Berryman, S. E. (1993). Learning in the workplace. In L. Darling-Hammond (Ed.), Review of research in education, Washington, DC: American Educational Research Association.

This chapter is a current and comprehensive review of "generic" knowledge and skills required across many occupations and industries for all students, not just those entering the work force directly from high school. Using many different sources it is concluded that required skills are indeed changing. Higher levels of basic skills are needed, as are higher level thinking skills; learning skills are needed; teamwork abilities and other interpersonal skills are essential. Much specificity is needed to translate needed skills into curricular and pedagogical changes, shifting learning from limited transfer and passivity to transfer of general skills and active engagement.

Bodilly, S., Ramsey, K., Stasz, K, & Eden, R. (1993). Integrating academic and vocational education: Lessons from eight early innovators. University of California, Berkeley: National Center for Research in Vocational Education.

This study explores the practices and policies defining reform efforts aimed at integrating academic and vocational education. It describes how eight high schools have attempted to implement integration reforms and examines the implications of their experience for educational policy.

Bottoms, G., Presson, A., & Johnson, M. (1992). Making high schools work through the integration of academic and vocational education. Atlanta, GA: Southern Regional Education Board.

This book discusses the experiences of a group of high schools in transition. The schools are moving from an old model in which little was expected of students enrolled in general and vocational courses, to a new model in which students are expected an encouraged to achieve higher academic and vocational standards. The book presents the foundational work leading to installing a "High School That Work" program to redesign high schools around the concept of "effort." The concept is premised on the belief that students who are motivated to put forth a solid effort can master higher-level academic content, regardless of their perceived ability or their past performance.

Brustein, M., & Mahler, M. (1994). AVA Guide to the School-to-Work Opportunities Act. Alexandria, VA: American Vocational Association.

This source provides an overview which describes the nee for the School-to-Work

Opportunities Act. It follows the overview with a discussion and detailed discussion and analysis of the Act.

California School Boards Association (1995). Increasing rigor and relevance: Linking school-to-career: Best school practices. Sacramento, CA: California School Boards Association.

In 1994 the California School Boards Association (CSBA) was selected as one of eleven national demonstration projects on the integration of academic and vocational learning. This paper is national in scope and features a wide variety of school districts and focuses on their commitment to achieving the integration of academic and vocational education.

Carnevale, A. P. (1991). America and the new economy. San Francisco: Jossey-Bass Publishers.

This book summarizes current and emerging economic realities of the American workplace. Technological and other changes are discussed in relation to their impact on the economy and the nature of standards successful businesses must meet. Included in the book is a list of 16 job skills that are required of workers to enable business success. These include both cognitive and affective foundation skills, academic basics, communication, problem solving and creativity, developmental skills, group effectiveness skills, and influencing skills.

Carnevale, A. P., Gainer, L. J., & Meltzer, A. S. (1990). Workplace basics: The essential skills employers want. San Francisco: Jossey-Bass Publishers.

This book details the findings of a three-year nation-wide study on the essential skills needed by the changing work force. The study represents a comprehensive effort to identify not only the skills but standards and implications for training. An entire chapter is devoted to each of the sixteen skills. The study revealed that in addition to previously identified "basics" (reading, writing, mathematics, and problem solving), employers cited the need for workers to have group effectiveness and other skills.

Carnevale, A. P., Gainer, L. J., & Meltzer, A. S. (1990). Workplace basics training manual. San Francisco: Jossey-Bass Publishers.

This manual provides a step-by-step guide to establish and implement a basic skills training program. The sixteen "essential skills" employers want are reviewed and a model is presented for how a training program could be organized and implemented. Included are specific suggestions for curriculum, exercises, and sample forms.

Chandler, C. E. (1992). Bridging the literacy gap: An employer's Guide. Washington, DC: Center for Work Force Preparation and Quality Education, U.S. Chamber of Commerce.

This short document provides business leaders with the tools needed to establish workplace adult literacy programs. Suggestions are made to establish and implement a literacy program, with examples provided from several businesses.

Council of Chief State School Officers (1994). Building a system to connect school and employment. Washington, DC: American Youth Policy Forum.

The publication identifies the issues related to building a coherent and effective system of youth development and career preparation from the perspectives of the Council, practitioners, researchers, and policy makers, labor officials, and federal and state governments.

Craftsmanship 2000: A work based learning project. (1992). Tulsa, OK: Metropolitan Tulsa Chamber of Commerce.

These materials summarize the efforts of the Tulsa schools and corporations to develop and implement a comprehensive apprenticeship program to train skilled craftsmen for industry.

Developing SCANS assessment measures: Technical report. (1992). Iowa City, Iowa: American College Testing. Using the SCANS report as a foundation for essential employability skills, ACT outlines how it can respond to the need to develop measures of the skills.

Finegold, D. (1993). Making apprenticeships work. Santa Monica, CA: RAND Issue Paper.

This brief paper reviews three criteria to critique existing apprenticeship ideas and proposes and alternative youth-training program. The criteria include (1) the need to upgrade the prestige of apprenticeships so that it is not identified as a program for only those who do not go to college; (2) providing sufficient funds to ensure a high-quality experience; and (3) to be careful not to try to copy Germany's system.

Fort Worth: Project C3: Identification of workplace skills. (1992).Fort Worth, TX: Fort Worth Public Schools.

This report is the result of a survey of 3,500 employees and 300 companies and organizations in Fort Worth that analyzed 791 jobs and determined level of proficiency required to perform specific job tasks in seven areas (reading, mathematics, writing,

speaking and listening, computer literacy, reasoning and problem-solving, and originality and creativity).

Fort Worth: Project C3: Transforming our schools. (1991). Fort Worth, TX: Fort Worth Public Schools.

This booklet and accompanying documents summarize a cooperative project between business, higher education, and community to motivate and prepare students for the workplace. Several projects are summarized, including vocational education initiatives, a student internship program, and a portfolio project.

Goldberger, S., & Kazis, R. (1996). Revitalizing high schools: What the school-to-career movement can contribute. Phi Delta Kappan (April), pp. 547-554.

In this article the authors propose a school-to-career approach that is inseparable from a strategy for high school reform. They feel that this proposal, which is based on their research and experience assisting schools, can accommodate rising ambitions of adolescents and can also carry the reform banner of contextual experiential learning further along into schools.

Grubb, W.N. (1996). The new vocationalism: What it is, what it could be. Phi Delta Kappan (April), pp. 535-546.

This article discusses the development of integrated instruction organized around broadly defined occupations. Grubb disentangles the strands of renewed interest in the occupational purposes of schooling, while concentrating on the high school. After discussing five versions of the "new vocationalism," interpretation is presented.

Grubb, W.N., & Stasz, C. (1992). Assessing the integration of academic and vocational education: Methods and questions. University of California, Berkeley: National Center for Research in Vocational Education.

This paper outlines the issues involved in an assessment of the extent and success of the integration of academic and vocational education. The paper also outlines eight approaches to integration and the secondary level, and also discusses changes that may occur when academic and vocational education are integrated.

Hamilton, M. A., & Hamilton, S. F. (1993). Toward a youth apprenticeship program: A progress report from the youth apprenticeship demonstration project in Broome county, New York. Ithaca, NY: Cornell University.

This publication summarizes current efforts of the Cornell program to implement an apprenticeship program derived from German models. It describes the needed

infrastructure for the program, objectives, curriculum, and examples of some of the forty students involved.

Hamilton, S. F. (1993). Prospects for an American-style youth apprenticeship system. Educational Researcher, 22, 11-16.

The author advocates a comprehensive apprenticeship system that involves employer involvement, learning at the work site, and equity.

Hartoonian, M., & Van Scotter, R., (1996). School-to-work: A model for learning a living. Phi Delta Kappan (April), pp. 555-560.

This article discusses various school-to-work issues and proposes a new school-to-work model. Implications for school-to-work programs are also discussed.

House joint resolution no. 143: Study of preparing a skilled work force. (1992). Richmond, VA: Virginia Department of Education.

This document summarizes the results of a joint DOE and SCHEV study on the efficacy of state public education in preparing a skilled work force for the 21st century. Focused on complex manufacturing to identify a model for researching other areas, the study identified critical competencies that must be developed. Recommendations are made to facilitate the development of these competencies.

Investment in the future. (1990, May). Presented to the Chesterfield County School Board, Chesterfield County, VA.

This is a summary of a 1989-90 study to determine the future direction and format for vocational education in the Chesterfield County Public Schools. Initiatives are identified to restructure vocational education to meet higher level skills, integrate academics, raise expectations, improve assessment and career development, and change curriculum and equipment.

Johnson, A. A., & Linden, F. (1992). Availability of a quality work force. New York: The Conference Board, Inc.

This report summarizes the results of more than 400 interviews with senior human resource executives about how their companies are planning to respond to changes in the labor force. Half of the high school graduates interviewed do not qualify for entry-level positions. Shortages exist in filling technical and skilled-labor positions.

Katzmann, S. (ed.), (1995). The role of career education in school-to-work transition (series No. 359). Columbus, OH: Education and Training for Employment Center.

The report provides an overview of career education approaches which complement school-to-work transitions. Program examples for assisting noncollege-bound students through youth apprenticeship; career academies; career resource centers; career guidance; and career education at elementary, middle and high school levels are provided.

Kazis, R. (1993). Improving the transition from school to work in the United States. American Youth Policy Forum, Washington D.C.; Competitiveness Policy Council, Washington, D.C.; Jobs for the Future, Inc., West Somerville, MA.

This paper clarifies and describes aspects of the school-to-work transition problem that is in need of repair. Trends in program and policy innovation at the local, state, and national levels are also identified. A set of policy proposals for the nation is also presented.

Krieg, F.J., Brown, P., & Ballard, J. (1995). Transition: School to work. National Association of School Psychologists.

This book gives a comprehensive look at the school to work transition. Various issues from legislation to transition approaches are discussed.

Labor force 2000: Corporate America responds. (1989). Chicago: Allstate Forum on Public Issues.

A task force of hundreds of major U.S. corporations formulated recommendations summarized in this report. Stressing the need for business, education, and community partnerships, it was concluded that there is a need for workers who can think creatively and respond intelligently to changing situations. The report identifies needed employment skills, categorized as academic skills or behavioral characteristics, and summarizes strategies for involving corporations in making needed changes.

Lankard, B.A. (1996). Restructuring and vocational education. Trends and issues alerts. Washington, D.C.: Office of Educational Research and Improvement. This paper discusses how educational restructuring is influencing the change in names of vocational education specialty areas as well as the change in course offerings for the specialties. A discussion of restructuring efforts is discussed.

McCaskin, N.L., & Headley, W.S. (1994). State approved performance measures for evaluating vocational education. Journal of Vocational Education Research, 19(2), 73-94.

This article reviews approved systems of measures and standards for use in vocational

education. States across the country have implemented various measures of academic and other performance. The paper focuses on the number and type of measures used in various states.

McMillan, J.H. (1993). Work force preparation: A review of the literature. Richmond, VA: Metropolitan Educational Research Consortium.
This literature review summarizes recent research and writing on the preparation of students for the workforce. The review clarifies important issues and themes that are related to the way in which high schools can better prepare students for the workplace.

McMillan, J. H. (1993). Student assessment in Richmond City schools: Business and government connections. Richmond, VA: Metropolitan Educational Research Consortium.

This report summarizes a series of nominal group interviews of Richmond area businesses that were undertaken to identify important work force competencies. National and state initiatives are reviewed in the context of testing programs in Richmond City Schools to determine the extent to which important work force skills are currently assessed.

Michigan employability skills. (1992). Lansing, MI: Michigan Department of Education.

This report summarizes important academic, personal management, and teamwork skills that are important to an effectively educated work force.

National Center for Research in Vocational Education. A school-to-work resource guide: Focusing on diversity. University of Illinois: Office of Special Populations; University of California, Berkeley: National Center for Research in Vocational Education.

This guide is designed for educators who are developing or implementing a school-to-work program. It includes sections on publications, requirements of the School-to-Work Opportunities Act of 1994, as well as sections on Transition Issues for Special Populations and Gender Equity Issues.

National Commission on Excellence in Education (1983). A nation at risk: The imperative for educational reform. Washington, D.C.: National Commission on Excellence in Education.

This report investigates the declining state of the educational system in America, as measured by performance of high school students in the U.S. and other countries. The report identifies specific problem areas and offers recommendations for improvement.

Oakes, J., Selvin, M., Karoly, L., & Guiton, G. (1992). Educational matchmaking: Academic and vocational tracking in comprehensive high schools. Santa Monica, CA: RAND.

This report is a detailed summary of a study of three comprehensive high schools to understand the rationale and processes that underlie course offerings and students' course taking as related to vocational education. Results suggest that curriculum decisions centered almost exclusively on the schools' academic offerings; decisions about vocational offerings and placements clearly took a "back seat." The findings were used to suggest how the culture of the high schools may pose challenges for integrating academic and vocational topics, skills, and staff.

O'Neil, H. F., Jr., Allred, K., & Baker, E. L. (1992). Measurement of work force readiness: Review of theoretical frameworks Los Angeles: National Center for Research on Evaluation, Standards, and Student Testing.

This report summarizes five studies that identified skills necessary for the work force and compares the frameworks to identify common elements. Also, two prototype measures are related to the findings common to the five studies, one in problem solving skills and one in negotiation/conflict resolution.

O'Neil, H. F., Jr., Allred, K., & Baker, E. L. (1992). Measurement of work force readiness competencies: Design of prototype measures. Los Angeles: National Center for Research on Evaluation, Standards, and Student Testing.

A fourteen step process is reviewed for creating and validating measures of work force readiness. Cognitive requirements of several SCANS skills are summarized, including item-writing specifications.

Osterman, P. & Iannozzi, M. (1993). Youth apprenticeships and school-to-work transition: Current knowledge and legislative strategy. Philadelphia, PA: National Center on the Educational Quality of the Workforce (ED 363 763).

The paper outlines the desired characteristics of a youth employment policy. It highlights principles which should be followed in designing youth apprenticeship programs.

Philipsen, M., & Noblit, G. (in press), Tricky business: Corporate conceptions of educational reform. The High School Journal.

This paper summarizes the history of corporate involvement in education and analyzes corporate conceptions of educational reform. It is concluded that business-like

approaches to educational reform will be counter-productive.

Ryan, R. D., Imel, S. (1996). School-to-work transition: Genuine reform or the latest fad? The ERIC Review 4(2), 2-11.

The article summarizes school-to-work initiatives and introduces issues raised by advocates and critics. It provides an overview of the Act, and attempts to describe this fuzzy initiative. It also identifies promising innovations to implement the law. Finally, it describes the limited literature surrounding program control, nature of reform, student tracking, program outcomes, and accessibility of activities.

Saterfiel, T. H. (1993, April). Work keys: Strengthening the school-to-work transition. Paper presented at the meeting of the National Council on Measurement in Education, Atlanta, GA.

This paper describes the Work Keys assessments. These assessments are being developed by the American College Testing company and will include tests of generic work force skills in applied mathematics, listening and writing, reading for information, teamwork, applied technology, and locating information.

Secretary's Commission on Achieving Necessary Skills (1991). What work requires of schools: A SCANS report for America 2000. Washington, D.C.: U.S. Department of Labor. (ED 332 054).

A landmark report from the Secretary of Labor and Secretary's Commission on Achieving Necessary Skills that outlines new competencies high school students need to demonstrate in order to perform at high levels in the workplace. Five competencies are identified: resources, interpersonal, information, systems, and technology. Three foundation areas are also identified: basic skills, thinking skills, and personal qualities. Armed with this knowledge, it became apparent that a successful integration of both academic and vocational education would be needed to produce highly skilled individuals for the workforce of the future. However, there is no clear cut approach to successfully integrating academic and vocational education. Many approaches are currently being utilized in this endeavor.

SIAVE Self-Assessment (Status of the Integration of Academic and Vocational Education. The Center for Vocational Education Professional Development Center, Temple University.

The SIAVE instrument allows professional staff members to collaboratively examine their degree of integration for a designated student cohort group. Both academic and vocational teachers, administrators, and various support personnel convene as professional partners in a Small Learning Community (SLC) to determine their relative

status in the integration process.

Stasz, C., Kaganoff, T., & Eden, R.A. (1994). Integrating academic and vocational education: A review of the literature, 1987-1992. Journal of Vocational Education Research, 19(2), pp. 25-72.

This paper is a comprehensive literature review from 1987 thru mid-1992 and was used by The National Assessment of Vocational Education (NAVE) to assess the extent and success of academic and vocational education.

Stasz, C., Ramsey, K., Eden, R., DaVanzo, J., Farris, H., & Lewis, M. (1993). Classrooms that work: Teaching generic skills in academic and vocational settings. University of California, Berkeley: National Center for Research in Vocational Education.

This publication discusses the second of two studies on teaching and learning generic skills in high school. This study extends earlier work by providing a model for designing classroom instruction in both academic and vocational classrooms where teaching generic skills is an instructional goal.

State initiatives for school and the workplace. (1991). Washington, DC: Council of Chief State School Officers.

This is a resource compendium of state initiatives to improve school and workplace learning. This includes initiatives to improve the connection between school and employment, to ensure student readiness for high-performance employment opportunities and lifelong, higher-order learning, and to provide types of restructured learning environments curricula, and appropriately trained staff to realize these goals. CCSSO calls for a restructuring of secondary schooling to achieve a highly skilled work force.

U.S. Department of Education (1994). School-to-work: What does the research say about it? Pittsburgh, PA: Superintendent of Documents.

The volume presents a series of commissioned papers which address what is known about the German system, noncollege-bound youth, and relevant governance issues. It also presents recommendations for creating a school-to-work system.

Vansickle, T. R. (1993, April). Work keys: Issues of validity for education and business applications. In T. H. Saterfiel (Chair), Work keys: Criterion related assessment can support the transition from school to work. Symposium presented at the annual meeting of the National Council on Measurement in Education, Atlanta, GA.

This paper describes efforts by ACT to validate Work Keys, assessments of generic work force skills. Criterion-related and content-related evidence are emphasized, along with job profiling.

Walker, T.J., Brower, E.B., and Wichowski, C.P. (1995). Changing schools from the inside out: Professional development through application of the SIAVE self-assessment.

This article discusses how most efforts to improve schools through the integration of academic and vocational education have recognized the need for staff development and how most staff development efforts have failed. An instrument designed to facilitate staff development is presented. The SIAVE Self-Assessment (Status of the Integration of Academic and Vocational Education) is presented.

Walling, S. (1995). Integrating academic and vocational skills. Paper presented at the Annual Professional Development Conference (1st, Roxbury Crossing, MA, June 3, 1995).

This article discusses how the Allied Health Certificate Program at Massachusetts' Bunker Hill Community College has been successfully integrating academic and vocational education since 1986.

Weinbaum, A., & Rogers, A. M. (1995). Contextual learning: A critical aspect of school-to-work transition programs. Washington, DC: Academy for Educational

Development and National Institute for Work and Learning.
The publication presents the benefits of contextual learning. It also identifies the issues the initiative presents for teachers.

Wenrich, R.C. (1996). Still the 'forgotten half' after all these years. Phi Delta Kappan (April), pp. 561-562.

This article discusses the pervasive belief that all high school graduates should go on to college and how that belief is harmful to a large proportion of today's student population. A scheme is presented that would prepare the academically oriented and the non-college bound for productive futures.

Wirth, A. G. (1993). Education and work: The choices we face. Phi Delta Kappan, 75, 361-366.

This article reviews important changes in our post-industrial society and the implications of these changes for work force preparation and education.

Wirth, A. G. (1992). Education and work for the year 2000: Choices we face. San Francisco: Jossey-Bass Publishers.

In this book Wirth reviews the evidence which suggests that we are confronted with revolutionary technological and economic changes that demands new educational standards for preparing students for work. There is a need for a better-educated, flexible work force capable of continuous learning. Additional chapters cover such topics as testing, restructuring, computers, and vocational education. Throughout the argument is made that we must educate our students for different types of thinking, disciplined effort, an appreciation of the importance of quality, and the ability to collaborate with others.